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ABSTRACT

This junior high teaching unit on careers in conservation of the environment and natural resources is one in a series of career guidebooks developed by Project CHOICE (Children Have Options in Career Education) to provide the classroom teacher with a source of career-related activities linking classroom experiences with the world of work. The unit follows a typical format that includes the rationale, goals, performance objectives, instructional strategy, evaluation, and suggested instructional materials (including books, films, and filmstrips). The remainder of the unit is comprised of instructional activities designed to acquaint students with careers in conservation and natural resources as an opportunity to control noise, water, and solid waste pollution, and to manage and conserve our energy, land, and natural resources. (For junior high units in other career clusters see CE 025 738-765.) (LRA)

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OFFICE OF CLAUDE W. RICHARDSON
KERN COUNTY SUPERINTENDENT OF SCHOOLS
Division of Instructional Services

Project CHOICE
#26

# A CAREER EDUCATION UNIT FOR JUNIOR HIGH SCHOOL

## CAREERS IN CONSERVATION OF THE ENVIRONMENT AND NATURAL RESOURCES

Agriculture and Ecological Studies Cluster
Science and Engineering Occupations Cluster

CE 025 762

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
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September, 1979

## FOREWORD

Project CHOICE: Children Have Options in Career Education, is an Exemplary Project from the San Diego City School District, which has been adapted, with ESEA Title IV-C funding, for Kern County Schools.

Through Project CHOICE, units have been developed to provide the classroom teacher with a source of career-related activities linking classroom experiences with the world of work. All students, regardless of their post-high school plans, share an equal need for career awareness, decision making skills, and other elements of career education. This goal can be accomplished if all teachers and counselors "fit" the appropriate units where they best apply in the curriculum.

We are indebted to the San Diego City School District, and the Project CHOICE staff, for developing and field testing the original units.

For their excellent work in rewriting the units in order to adapt them for use in Kern County Schools, we wish to recognize:

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A CAREER EDUCATION UNIT FOR JUNIOR HIGH SCHOOL

CAREERS IN CONSERVATION OF THE ENVIRONMENT AND NATURAL RESOURCES

CONTENTS


| | Page |
|---|---|
| RATIONALE | 1 |
| GOALS | 1 |
| PERFORMANCE OBJECTIVES | 1 |
| INSTRUCTIONAL STRATEGY | 2 |
| EVALUATION | 2 |
| INSTRUCTIONAL ACTIVITIES | 3 |
| PRETEST AND POST TEST | 6 |

A CAREER EDUCATION UNIT FOR JUNIOR HIGH SCHOOL

# CAREERS IN CONSERVATION OF THE ENVIRONMENT AND NATURAL RESOURCES

Agriculture and Ecological Studies Cluster
Science and Engineering Occupations Cluster

## RATIONALE

Although many students are aware of the urgency of problems in our environment, they may not be aware of the broad range of career opportunities in fields which seek solutions to these problems. Through this unit, students will become aware of careers in conservation of the environment and natural resources as an opportunity to control noise, air, water, and solid waste pollution, and to manage and conserve our energy, land and natural resources. They will learn to value and protect our natural environments as well as the living conditions in our town and cities.

## GOALS

Through this unit the students will:

- -Learn about the variety of careers involved in environmental studies and the management of natural resources.
- -Become aware of the needs, interests, and career opportunities available in each environmental field.
- -Become familiar with vocabulary, specific jobs, and tools used in environmental-related careers.
- -Learn the study requirements, job descriptions and special skills needed for careers in conservation of the environment and natural resources.
- -Develop an awareness of the importance of careers in conservation of the environment and natural resources for earth's future.

## PERFORMANCE OBJECTIVES

By the end of this unit, students will be able to:

- -Name four broad areas of environmental problems and supply the name of an occupation dealing with each one.
- -Identify at least five occupations dealing with environmental studies and natural resources and supply a general description of each one.
- -Describe one career in the conservation of the environment in detail, stating special skills and qualifications, level of education and/or training, salary, opportunities for advancement, and demand for this career.

-Identify tools and equipment used in careers in the environment and natural resources.

-State a personal opinion concerning the need for persons involved in careers in the environment and in natural resources.

INSTRUCTIONAL STRATEGY

This curriculum unit has been designed for use by a class, small group, or individual student. So that the materials can be easily duplicated for individualized instruction, all learning activities are written for the student. Activities designated ALL are intended to provide factual information, those designated YOUR CHOICE have been included to provide experiential activities which draw upon this background. This technique also provides an opportunity to put decision-making skills into action in the classroom, a process important to career development.

EVALUATION

It is important to evaluate the effectiveness of this unit in terms of the learning that takes place as well as reactions of the learner. A sample inventory has been provided, which can serve to both introduce the unit and assess its effectiveness, or the teacher may wish to develop his/her own.

AVAILABLE IN INSTRUCTIONAL RESOURCES CENTER (IRC): OFFICE OF THE KERN COUNTY SUPERINTENDENT OF SCHOOLS

| | | | |
|---|---|---|---|
| Films: | MP | 5481 | What Ecologists Do |
| | MP | 2601 | Earth Science - Seeking and Conserving Mineral Resources |
| | MP | 1707 | Energy-Choices-Options-Decisions |
| | MP | 1708 | Energy Challenge |
| | FK | 885, 880, 1077, 1078, 1079 | (Filmstrip Kits) Ecology and Agriculture Series |
| | MP | 591 | Buttercup |
| | MP | 1682 | Cities in Crisis - A Matter of Survival |
| | MP | 1802 | Nature has an Answer |
| | MP | 601 | Lakes - Aging & Pollution |
| | MP | 1045 | Pollution |
| | MP | 1271 | Runaround |
| | FK | 2667 | Pollution (Filmstrip Kit) |
| | FK | 1832 | Water Pollution - A Complex Problem |
| | MP | 1970 | Water, Water, Everywhere...Not a Drop to Drink |

AVAILABLE, OFFICE OF THE KERN COUNTY SUPERINTENDENT OF SCHOOLS: CONTACT JANET WELLS, CAREER-EDUCATION RESOURCE TEACHER

Book (Check out for limited time period): Career Education and the Environment; contains extensive teacher information, job descriptions, activity and resource suggestions.

A CAREER EDUCATION UNIT FOR JUNIOR HIGH SCHOOL

## CAREERS IN CONSERVATION OF THE ENVIRONMENT AND NATURAL RESOURCES

Agriculture and Ecological Studies Cluster
Science and Engineering Occupations Cluster

### INSTRUCTIONAL ACTIVITIES

ALL:

1. PRETEST - Take the written pretest to find out how much you already know about careers in environmental studies and natural resources.

2. Careers in conservation of the environment and natural resources offer opportunities to work in many areas of concern. Among these are air quality, water quality, control of noise, urban planning, range management, energy conservation. Choose one career from the fact sheet Careers in Conservation of the Environment and Natural Resources and find out more about it. Ask your school or public librarian to help you find the information you need. Use the Career Information Sheet contained in this unit as a guide.

3. If possible, view films about endangered wildlife, pollution and conservation of natural resources.*

4. Many careers in environmental studies and natural resources may focus on the same environmental area. For example, conditions in a bay may be of concern to a fisheries biologist, a water quality control investigator, and a wildlife biologist. Using the career information which you have gathered, join with a group of other students who are interested in investigating a particular environment:

| | |
|---|---|
| urban area | rangeland |
| desert | mountain |
| ocean | marshland |

Approach the study of the environmental area from the point of view of the career you are studying and include these questions:

What is your specific concern in this environment?
What tools or instruments or techniques would you use in your work?
With what other career areas do you work most closely?
What major threats to this environment do you see in the 1970's and 1980's?

5. Look at the list of careers on the fact sheet Careers In Conservation Of The Environment and Natural Resources. If you know of people in your community who work in these jobs, try to arrange to have them visit your class. Ask your teacher to help you make the arrangements.

*To the teacher: See film suggestions available at Kern County Superintendent of Schools, IRC listed at beginning of this unit.

6. Energy consumption is an important area of environmental concern. Investigate your school's energy consumption: ask your principal about energy use during the past six months. What are the gas and electric bills for your school: Ask the head custodian if you can see the school's gas and electric meter and read it, using the diagrams below. What appliances or equipment are the major users of energy in your school? Is there an energy conservation program in effect? Can you think of other ways in which energy use might be reduced? If you are in a windowless school which required energy for heating, cooling and lighting, compare your school's energy bills with those of a similar-sized school with windows.

Looking directly at the meter, read from the far right dial to the left. Read each dial in the direction indicated by the arrows.

If the dial hand is between two numbers, write down the lower number. When a dial hand is exactly on a number, look at the meter face to the right. If its dial hand has not passed zero, record the next lowest number. For example, in the illustration Dial D appears to be on 5. However the hand in Dial C has not passed zero so the number for Dial D is actually 4.

While the meter reading is taken from right to left, it is read from left to right so the meter reading in this example is 14981. Meters are read approximately every 30 days on or about the same day of each month.

Check your last two bills to see when yours is read, if you're keeping track. Some meters have only four dial faces. The reading then is a four digit number, taken the same way.

7. Your town or city environment is of vital concern to you. Working individually or with a small group of students, survey an area near your school, not more than a mile on each side.

   a. List all the factors you can think of which might affect the quality of that environment.

   b. Then determine the state of each factor, for example: How many people live on one representative block in that area? What is the condition of the streets in the area? How many trees are there on one representative block? What opportunities for transportation exist there? How much open space is there? Is there standing water which would serve as a breeding place for mosquitoes? Are there other health hazards?

Prepare a map to illustrate your urban environment and show what you have found out about it. Use the map in a report of your findings to your class.

8. Scientists and physicians are becoming increasingly aware of the impact of the environment on physical health. For example, our bodies may react involuntarily to loud sounds, no matter how old we are or how pleasing the sound may be. These body changes may be injurious to health.

   Experiment with sound and blood pressure. You will need a blood pressure kit (your school nurse can help you), a sound source (a radio or record player), and, if possible, a sound level meter (your teacher may be able to borrow one from a senior high school).

   Record a person's blood pressure while he/she is in a quiet area, then record it again while he/she is subjected to varying levels of sound. Use the sound level meter to record the level of sound for each exposure. If possible, plot your data on a graph with blood pressure levels on the vertical and sound levels on the horizontal.

   Ask yourself: Did sound seem to affect the blood pressure? If so, how? Is a change in blood pressure harmful to the body?

   Report your experiment and results to the class.

9. What do you think is the most serious environmental problem affecting Kern County today? Try to find newspaper and magazine articles which deal with this problem. Talk to your parents and other adults who are interested in the problem. If possible, attend meetings about the subject. Report your findings to the class.

10. POST TEST

CAREERS IN CONSERVATION OF THE ENVIRONMENT
AND NATURAL RESOURCES: PRETEST AND POST TEST

1. Name at least four areas of our environment in which there is a need for people to work in study and protection:

_____ _____

_____ _____

2. Match the name of the occupation with a short description of the duties involved.

| | |
|---|---|
| 1. vapor control inspector | A. defends clients legal rights in environmental concerns |
| 2. soil scientist | B. enacts legislation for protection of environment and resources. |
| 3. fish and game warden | C. studies plant and animal life in bays, rivers, lakes. |
| 4. environmental attorney | D. takes samples of soil to analyze suitability for development. |
| 5. government official | E. checks gasoline stations for efficiently functioning equipment. |
| 6. aquatic biologist | F. enforces laws for the protection of wildlife. |

3. List four kinds of environmental problems which occur in your environment:

_____ _____

_____ _____

4. Why are careers in conservation of the environment and natural resources important?_____

_____

_____

## CAREER INFORMATION SHEET

1. Career title: _____

2. What kind of work is done? _____

   _____

3. What skills are needed? _____

   _____

4. What education and training is needed? _____

   _____

5. What school subjects are important for this job? _____

   _____

6. What are the working conditions? Where is the work done? Is the work hazardous and unsafe? Is there a lot of traveling? _____

   _____

7. Where are the jobs located? Is there a need predicted for this job in the future?

   _____

8. In what way is this job useful to society? _____

   _____

## SOME CAREERS IN CONSERVATION OF THE ENVIRONMENT AND NATURAL RESOURCES

Key to training: A=high school; B=technical school or community college; C=college

AIR QUALITY CONTROL
- Chemical Engineer (C)
- Analytical Chemist (C)
- Air Quality Inspector (B, C)

WATER QUALITY CONTROL
- Environmental Engineer (C)
- Aquatic Biologist (C)
- Water Quality Inspector (B, C)
- Water Treatment Plant Operator (A)

NOISE CONTROL
- Noise Inspector/Technician (A, B)
- Industrial Health Engineer (C)
- Aeronautical Engineer (C)

SOLID WASTE MANAGEMENT
- Refuse Collector (A)
- Incinerator Plant Attendant (A)
- Chemical Engineer (C)

ENERGY CONSERVATION
- Geologist (C)
- Vapor Control Inspector (B)
- Aeronautical Engineer (C)
- Automotive Engineer (C)

LAND USE PLANNING AND MANAGEMENT
- Land-use Technician (B)
- Landscape Architect (B, C)
- Soil Scientist (C)
- Urban Planner (C)
- Range Manager (B, C)
- Gardener (A)

WILDLIFE MANAGEMENT
- Biological Technician (B)
- Zoologist (C)
- Animal Ecologist (C)
- Fish and Game Warden (B, C)
- Wildlife Attendant (A)

ENVIRONMENTAL HEALTH
- Sanitarian (C)
- Sanitary Aide (B)
- Environmental Attorney
- Environmental Educator (C)
- Environmental Writer (B, C)